WHAT IS CLAIMED IS:

1. An apparatus, comprising:

an antenna section having a plurality of antenna elements, and having circuitry which includes a plurality of circuit portions each operatively coupled to a respective one of said antenna elements; and

a cooling section which accepts and dissipates heat generated by said circuitry, said cooling section including a loop containing a cooling fluid, and including a wick disposed within said loop in the region of said circuitry, said wick effecting a capillary pressure which urges said fluid to travel around said loop.

2. An apparatus according to Claim 1, wherein said antenna section includes a phased array antenna, said antenna elements and said circuitry being portions of said phased array antenna.

3. An apparatus according to Claim 2,

wherein said antenna elements are arranged in a plurality of rows;

wherein said phased array antenna includes a plurality of parallel slats which each have thereon a plurality of said circuit portions that correspond to said antenna elements in a respective said row; and

wherein said cooling section includes a plurality of evaporators which are each disposed adjacent a respective one of said slats.

4. An apparatus according to Claim 3, wherein said evaporators are each disposed between and adjacent two of said slats.

5. An apparatus according to Claim 2,

wherein said antenna elements all lie approximately in a common plane;

wherein said circuitry is provided on a circuit board extending approximately parallel to said plane of said antenna elements; and

wherein said cooling section includes an evaporator disposed adjacent at least a portion of said circuitry.

6. An apparatus according to Claim 1, wherein said loop of said cooling system is a capillary pumped loop.

7. An apparatus according to Claim 6, wherein said loop of said cooling system includes:

an evaporator having said wick therein;

a condenser disposed along said loop at a location remote from said evaporator, said fluid flowing through each of said evaporator and said condenser; and

a reservoir which is in fluid communication with said loop, and which contains a quantity of said fluid.

8. An apparatus according to Claim 7,

wherein said cooling system is configured to sub-cool the fluid exiting said condenser; and

including a heater for causing the fluid arriving at said evaporator to have approximately a selected temperature.

9. An apparatus according to Claim 8,

including a sensor for sensing the temperature of the fluid within said reservoir; and

wherein heat from said heater is supplied to said fluid in said reservoir.

10. An apparatus according to Claim 1, wherein said loop of said cooling system is a loop heat pipe.

11. An apparatus according to Claim 10, wherein said loop of said cooling system includes:

an evaporator having a compensation chamber and having said wick therein; and

a condenser disposed along said loop at a location remote from said evaporator, said fluid flowing through each of said evaporator and said condenser.

12. An apparatus according to Claim 11,

wherein said cooling system is configured to sub-cool the fluid exiting said condenser; and

including a heater for causing the fluid arriving at said evaporator to have approximately a selected temperature.

13. An apparatus according to Claim 1,

wherein said loop of said cooling system includes an evaporator having said wick therein; and

including an isolator disposed at an inlet to said evaporator.

14. An apparatus according to Claim 1,

wherein said loop of said cooling system includes an evaporator having said wick therein, and includes a condenser; and

including a heat sink which is in thermal communication with said condenser.

15. A method of cooling an apparatus which includes an antenna section with a plurality of antenna elements, and circuitry having a plurality of circuit portions each operatively coupled to a respective one of said antenna elements, comprising the step of utilizing capillary pressure of a cooling fluid within a wick in a loop to urge the fluid to travel around said loop, said wick being disposed within said loop in the region of said circuitry.

16. A method according to Claim 15, including the step of selecting as said loop a capillary pumped loop.

17. A method according to Claim 15, including the step of selecting as said loop a loop heat pipe.

18. A method according to Claim 15, wherein said loop includes an evaporator having said wick therein, and includes a condenser disposed along said loop at a location remote from said evaporator, said fluid flowing through each of said evaporator and said condenser; and including the steps of:

sub-cooling the fluid exiting said condenser; and

heating the fluid in a manner causing the fluid arriving at said evaporator to have approximately a selected temperature.

19. An apparatus, comprising:

structure which generates heat; and

a cooling section which accepts and dissipates heat generated by said structure, said cooling section including a loop containing a cooling fluid, said loop including a plurality of evaporators disposed in the region of said structure, a manifold section for distributing fluid flowing through said loop among said evaporators, and a plurality of wicks which are each disposed within a respective said evaporator, said wicks effecting a capillary pressure which urges said fluid to travel around said loop, said manifold section including a plurality of first passageway sections which each have an inlet end and which each have an outlet end coupled to an input of a respective said evaporator, and said manifold section having a plurality of second passageway sections that each have a first end which is approximately normal to and communicates with a respective said first passageway section, and that each have a second end which is coupled to said first end of a different said first passageway section.

20. An apparatus according to Claim 19, wherein said manifold section distributes the fluid to said evaporators in a sequence corresponding to a progressive increase in the respective amounts of heat accepted by said evaporators from said structure.

21. An apparatus according to Claim 19, wherein said structure includes an antenna section having a plurality of antenna elements, and having circuitry with a plurality of circuit portions that are each operatively coupled to a respective one of said antenna elements, said circuitry generating said heat which is accepted and dissipated by said cooling section.

22. An apparatus according to Claim 21, wherein said antenna section includes a phased array antenna, said antenna elements and said circuitry being portions of said phased array antenna.

23. An apparatus according to Claim 22,

wherein said antenna elements are arranged in a plurality of rows;

wherein said phased array antenna includes a plurality of parallel slats which each have thereon a plurality of said circuit portions that correspond to said antenna elements in a respective said row; and

wherein said evaporators are each disposed adjacent a respective one of said slats.

24. An apparatus according to Claim 23, wherein said evaporators are each disposed between and adjacent two of said slats.

25. An apparatus according to Claim 22,

wherein said antenna elements all lie approximately in a common plane;

wherein said circuitry is provided on a circuit board extending approximately parallel to said plane of said antenna elements; and

wherein each said evaporator of said cooling section is disposed adjacent at least a portion of said circuitry.

26. An apparatus according to Claim 19, wherein said loop of said cooling system is a capillary pumped loop.

27. An apparatus according to Claim 26, wherein said loop of said cooling system includes:

a condenser disposed along said loop at a location remote from said evaporators, said fluid flowing through said evaporators and through said condenser; and

a reservoir which is in fluid communication with said loop, and which contains a quantity of said fluid.

28. An apparatus according to Claim 27,

wherein said cooling system is configured to sub-cool the fluid exiting said condenser; and

including a heater for causing the fluid arriving at said evaporators to have approximately a selected temperature.

29. An apparatus according to Claim 28,

including a sensor for sensing the temperature of the fluid within said reservoir; and

wherein heat from said heater is supplied to said fluid in said reservoir.

30. An apparatus according to Claim 19, wherein said loop of said cooling system is a loop heat pipe.

31. An apparatus according to Claim 30,

wherein each said evaporator has a compensation chamber; and

wherein said loop includes a condenser disposed along said loop at a location remote from said evaporators, said fluid flowing through said evaporators and through said condenser.

32. An apparatus according to Claim 31,

wherein said cooling system is configured to sub-cool the fluid exiting said condenser; and

including a heater for causing the fluid arriving at said evaporators to have approximately a selected temperature.

33. An apparatus according to Claim 19, including a plurality of isolators which are each disposed at an inlet to a respective said evaporator.

34. An apparatus according to Claim 19,

wherein said loop of said cooling system includes a condenser disposed along said loop at a location remote from said evaporators, said fluid flowing through said evaporators and through said condenser; and

including a heat sink which is in thermal communication with said condenser.

35. An apparatus, comprising:

structure which generates heat; and

a cooling section which accepts and dissipates heat generated by said structure, said cooling section including a loop containing a cooling fluid, said loop including a plurality of evaporators disposed in the region of said structure, a manifold section for distributing fluid flowing through said loop among said evaporators, and a plurality of wicks which are each disposed within a respective said evaporator, said wicks effecting a capillary pressure which urges said fluid to travel around said loop, said manifold section distributing the fluid to said evaporators in a sequence corresponding to a progressive increase in the respective amounts of heat accepted by said evaporators from said structure.

36. An apparatus according to Claim 35, wherein said manifold section includes a plurality of first passageway sections which each have an inlet end and which each have an outlet end coupled to an input of a respective said evaporator, and includes a plurality of second passageway sections that each have a first end approximately normal to and communicating with a respective said first passageway section, and that each have a second end coupled to said first end of a different said first passageway section.

37. An apparatus according to Claim 35, wherein said structure includes an antenna section having a plurality of antenna elements, and having circuitry with a plurality of circuit portions that are each operatively coupled to a respective one of said antenna elements, said circuitry generating said heat which is accepted and dissipated by said cooling section.

38. An apparatus according to Claim 37, wherein said antenna section includes a phased array antenna, said antenna elements and said circuitry being portions of said phased array antenna.

39. An apparatus according to Claim 38,

wherein said antenna elements are arranged in a plurality of rows;

wherein said phased array antenna includes a plurality of parallel slats which each have thereon a plurality of said circuit portions that correspond to said antenna elements in a respective said row; and

wherein said evaporators are each disposed adjacent a respective one of said slats.

40. An apparatus according to Claim 39, wherein said evaporators are each disposed between and adjacent two of said slats.

41. An apparatus according to Claim 38,

wherein said antenna elements all lie approximately in a common plane;

wherein said circuitry is provided on a circuit board extending approximately parallel to said plane of said antenna elements; and

wherein each said evaporator of said cooling section is disposed adjacent at least a portion of said circuitry.

42. An apparatus according to Claim 35, wherein said loop of said cooling system is a capillary pumped loop.

43. An apparatus according to Claim 42, wherein said loop of said cooling system includes:

a condenser disposed along said loop at a location remote from said evaporators, said fluid flowing through said evaporators and through said condenser; and

a reservoir which is in fluid communication with said loop, and which contains a quantity of said fluid.

44. An apparatus according to Claim 43,

wherein said cooling system is configured to sub-cool the fluid exiting said condenser; and

including a heater for causing the fluid arriving at said evaporators to have approximately a selected temperature.

45. An apparatus according to Claim 44,

including a sensor for sensing the temperature of the fluid within said reservoir; and

wherein heat from said heater is supplied to said fluid in said reservoir.

46. An apparatus according to Claim 35, wherein said loop of said cooling system is a loop heat pipe.

47. An apparatus according to Claim 46,

wherein each said evaporator has a compensation chamber; and

wherein said loop includes a condenser disposed along said loop at a location remote from said evaporators, said fluid flowing through said evaporators and through said condenser.

48. An apparatus according to Claim 47,

wherein said cooling system is configured to sub-cool the fluid exiting said condenser; and

including a heater for causing the fluid arriving at said evaporators to have approximately a selected temperature.

49. An apparatus according to Claim 35, including a plurality of isolators which are each disposed at an inlet to a respective said evaporator.

50. An apparatus according to Claim 35,

wherein said loop of said cooling system includes a condenser disposed along said loop at a location remote from said evaporators, said fluid flowing through said evaporators and through said condenser; and

including a heat sink which is in thermal communication with said condenser.

51. A method of cooling structure which generates heat, comprising the steps of:

providing in the region of said structure a plurality of evaporators which each include a wick;

utilizing capillary pressure of the fluid within said wicks to urge the fluid to travel around said loop;

distributing fluid flowing through said loop among said evaporators with a manifold section having a plurality of first passageway sections which each have an inlet end and which each have an outlet end coupled to an input of a respective said evaporator, and having a plurality of second passageway sections that each have a first end which is approximately normal to and communicates with a respective said first passageway section, and that each have a second end which is coupled to said first end of a different said first passageway section.

52. A method according to Claim 51, including the step of configuring said manifold section to distribute the fluid to said evaporators in a sequence corresponding to a progressive increase in the respective amounts of heat accepted by said evaporators from said structure.

53. A method according to Claim 51, including the step of selecting as said loop a capillary pumped loop.

54. A method according to Claim 51, including the step of selecting as said loop a loop heat pipe.

55. A method according to Claim 51, wherein said loop includes a condenser disposed along said loop at a location remote from said evaporators, said fluid flowing through said evaporators and through said condenser, and including the steps of:

sub-cooling the fluid exiting said condenser; and

heating the fluid in a manner causing the fluid arriving at said evaporators to have approximately a selected temperature.

56. A method of cooling structure which generates heat, comprising the steps of:

providing in the region of said structure a plurality of evaporators which each include a wick;

utilizing capillary pressure of the fluid within said wicks to urge the fluid to travel around said loop;

distributing fluid flowing through said loop among said evaporators in a sequence corresponding to a progressive increase in the respective amounts of heat accepted by said evaporators from said structure.

57. A method according to Claim 56, wherein said distributing step is carried out using a manifold section that includes a plurality of first passageway sections which each have an inlet end and which each have an outlet end coupled to an input of a respective said evaporator, and that includes a plurality of second passageway sections, each said second passageway section having a first end approximately normal to and communicating with a respective said first passageway section, and having a second end coupled to said first end of a different said first passageway section.

58. A method according to Claim 56, including the step of selecting as said loop a capillary pumped loop.

59. A method according to Claim 56, including the step of selecting as said loop a loop heat pipe.

60. A method according to Claim 56, wherein said loop includes a condenser disposed along said loop at a location remote from said evaporators, said fluid flowing through said evaporators and through said condenser; and including the steps of:

sub-cooling the fluid exiting said condenser; and

heating the fluid in a manner causing the fluid arriving at said evaporators to have approximately a selected temperature.